Earth's Atmosphere and Weather

6-4 The student will demonstrate an understanding of the relationship between Earth's atmospheric properties and processes and its weather and climate. (Earth Science)

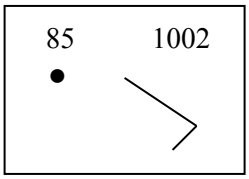
6.4.6 Predict weather conditions and patterns based on weather data collected from direct observations and measurements, weather maps, satellites, and radar.
Taxonomy level: 2.5-B Understand Conceptual Knowledge

Previous/Future knowledge: Recording and predicting weather using weather maps, satellite images, and radar is new to this grade – some foundational concepts were given in 4th grade (4-4.6). Fourth grade did not use these tools to predict weather.

It is essential for students to know weather conditions and patterns can be predicted based on weather data collected from various sources.

Direct Observations and Measurements
- Basic weather conditions can be observed and/or measured (using the instruments listed in 6-2.5) or obtained from *meteorologists* at national weather data collection sites.
- In order to make weather predictions, the data should be collected on a regular basis over a period of time.
- This allows for the development of patterns in weather conditions from the analysis of the data.
- For example, a hurricane's path can be predicted using data on its position over time (plotted on a hurricane tracking map), thereby allowing meteorologists to make predictions concerning the possible warnings to land areas in the hurricane's path.

Weather maps
- Weather maps can help predict weather patterns by indicating high or low pressure systems (*isobars*), movement of air masses and fronts, or temperature ranges (*isotherms*).
- *Station models* from specific locations provide information that can also be used to predict weather patterns.
- Information found on a station model can include cloud cover, temperature (85°F), wind direction and speed, precipitation (* - snow, ● – rain), or barometric pressure (1002 mb).



Satellites
- Satellite images are used for seeing cloud patterns and movements.
- For example, hurricane clouds and movement can be observed using satellite images.

Radar
- Radar images can be used to detect cloud cover, rainfall or storm location, intensity, and movement, as well as the potential for severe weather (for example, hurricanes or tornadoes).

It is not essential for students to know how to draw weather maps or isobar or isotherm lines. Students do not need to identify other information found on a station model such as the types of clouds, dew point, types of precipitation (other than snow or rain), or change in barometric pressure.

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Assessment Guidelines:

The objective of this indicator is to *predict* weather conditions and patterns based on weather data collected from direct observations and measurements, weather maps, satellites, and radar; therefore, the primary focus of assessment should be to take the presented material from direct observations and measurements, from weather maps, satellite images, and radar and use that information to show what might happen to local or national weather conditions. However, appropriate assessments should also require students to *interpret* a weather map, station model, or hurricane tracking map; *compare* a series of weather maps to show patterns or weather system movement; or *identify* weather symbols commonly found on weather maps.